



UNITED STATES PATENT AND TRADEMARK OFFICE

WV

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/669,862	09/26/2000	Ernest F. Hasselbrink JR.	SD-8289	5130
7590	08/19/2004			EXAMINER
Timothy Evans Sandia National Laboratories Post Office Box 969, Mail Stop 9141 Livermore, CA 94551-0969			STARSIAK, JOHN S	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/669,862	HASSELBRINK ET AL.
	Examiner	Art Unit
	John S. Starsiak Jr.	1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 09/26/2000.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-29 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1,2,6-11 and 15-29 is/are rejected.
 7) Claim(s) 3-5 and 12-14 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 26 September 2000 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 09/26/2000.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “means for introducing fluid” recited in claims 1, 9, 19, and 28; the “porous material recited in claims 3, 12, 21, and 29; the “structures disposed in the microchannel” recited in claims 4, 13, and 22; the “electrodes” recited in claims 6, 15, and 24; the “salt bridges” recited in claims 7, 16, and 25; the “reservoirs” recited in claims 8, 17, and 26; and the “structured particles” recited in claim 29 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will

be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

Claims 2, 11, and 19-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 2, 11, and 20 recite, "channel widths". However, there is no recitation of a "channel" in the proceeding language of each of these claims. It appears that the "channel width" corresponds to the width of the "at least one microchannel recites in claims 1, 10, and 19, respectively. Claim 19 recites "at least of one of **the branches or arms...**". There is no antecedent basis for recitation in the proceeding language of claim 19. From the written description of the invention it appears the "the branches or arms" correspond to the first and second microchannels recited in claim 19. Claims 20-27 are rejected because they depend on claim 19.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 6, 8-11, 15, 17-20, 24, and 26-29 are rejected under 35

U.S.C. 102(e) as being clearly anticipated by Griffiths et al. The above claims read the embodiment of Griffiths et al. illustrated in Figure 12 and described in column 14, lines 34-60. Specifically, “wherein at least one of the microchannels has a reduced effective cross-sectional area proximate the junction” recited in claim 1, “wherein at least one of said first and second microchannels has a region of reduced effective cross-sectional area proximate the junction” recited in claim 10, “wherein at least one of the branches or arms extending from the junction of said first or second microchannel “Y” is provided with a region of reduced effective cross-sectional area proximate the junction” recited in claim 19, “modifying at least one microchannel to produce one region of reduced cross-sectional area proximate the junction” recited in claim 28, and “reducing the geometric cross-sectional area of claim 29 read on constricted portion(s) 1208 of Griffiths et al. The “means for introducing fluid in the microchannels” recited in claims 1, 10, 19, and 28; the “the electrodes disposed in the microchannel system” recited in claims 6, 15, and 24; the “reservoirs” recited in claims 8, 17, and 26; and the “electrodes are disposed in the reservoirs” recited 9, 18, and 27 read on electrodes 103/203 of Griffiths et al and the reservoirs (e.g., 102, 106, 202,206) of Griffiths et al, which are illustrated in Figures 1 and 2. Claims 2, 11, and 20 read on Griffiths et al. [column 14, line 66 – column 15, line 1]: “Similarly, lengths of the contraction and expansion regions should generally range from about one to five times the width of the inlet.”

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 16, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Griffiths et al. in view of Chow et al.

Griffiths et al. teaches all of the particulars in these claims (see 102 rejection above) except for “the electrodes are connected to the microchannel by means of salt bridges”. Chow et al. teaches [column 7, line 67 to column 8, line 9]: “In order to prevent electrolytic degradation of reagent and/or buffer materials, each of the reservoirs 108, 110, 112, 116 and 120 is provided in electrical and/or fluid communication with an electrical access/salt bridge channel 128 a/b, 130 a/b, 132 a/b, 134 a/b, and 136 a/b, respectively. The provision of an electrical access reservoir/salt bridge allows the application of voltages via electrodes for long periods of time without resulting degradation of reagents, buffers, or the like.” It would have been obvious to one of ordinary skill in the art at the time of the invention to interpose salt bridges between the electrodes and the microchannels of Griffiths et al. because this would prevent the degradation of chemicals, e.g. buffers, in the microchannels of Griffiths et al.

Allowable Subject Matter

Claims 3-5 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Griffiths et al. is the closest prior art. Griffiths et al. discloses microfluidic devices comprising multiple microchannels wherein the effective cross-sectional area of at least one of the microchannels is reduced near the junction(s) of the microchannels. Griffiths et al. does not explicitly teach or fairly suggest that the reduced cross-sectional area comprises either "a porous material disposed in the microchannel" or "structures disposed in the microchannel". Similarly, Griffiths et al. does not explicitly teach or fairly suggest that "the reduced effective cross-sectional area is about 10% that of the cross-sectional area of the microchannel".

Claims 21-23 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Claims 21-23 are similar to claims 3-5 and 12-14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John S. Starsiak Jr. whose telephone number is (571)

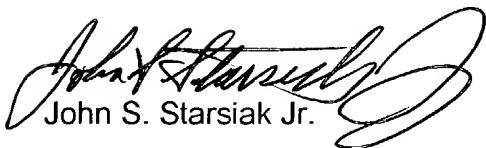
272-1346. The examiner can normally be reached on Monday to Friday from 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on (571) 272-1532. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700



John S. Starsiak Jr.

12 August 2004